

5.0 DISCUSSION

5.1 TERRESTRIAL ECOSYSTEMS AND SPECIES

Land development in the Florida Keys has displaced nearly 50 percent of all upland habitats, as well as large areas of saltwater wetlands. Over 90 percent of the remaining uplands are distributed in patches of 10 acres or less. In the Florida Keys, upland patches of less than 13 acres are considered to have lost key ecological functions (Bancroft 1994). Small patches of forests show lower biodiversity, increased vulnerability to invasion by exotic plant and animal species and decreased gene flow within and among populations. Any further encroachment into areas dominated by native vegetation would exacerbate habitat loss and fragmentation. Development in the Florida Keys has surpassed the capacity of upland habitats to withstand further development.

The secondary and indirect effects of development further contribute to habitat loss and fragmentation. Little habitat remains unaffected by development's secondary effects. While difficult to quantify, indirect effects cause significant habitat degradation, especially on small patches of habitat. Any further development in the Florida Keys would exacerbate secondary and indirect impacts to remaining habitat.

Terrestrial habitats in the Florida Keys show a combination of tropical, Caribbean and temperate species that are unique to the U.S., which is exemplified by over 100 species that occur only in the Florida Keys. Habitat loss is likely the most important cause of species depletion in the area, resulting in the protected legal status of dozens of species of plants and animals. Virtually every native area in the Keys is potential habitat for one or more protected species. Two species endemic to the Lower Keys, the Lower Keys marsh rabbit and the silver rice rat, are highly restricted and likely could not withstand further habitat loss without facing extinction. The Key deer, while largely recovered from population numbers as low as 25 in the 1950s, has a restricted range and will continue to face threats to its viability if development occurs in prime habitat. In the Upper Keys, large tracts of uplands are already under government ownership, yet privately owned uplands are also potential habitat for protected species such as the Schaus swallowtail butterfly or the Key Largo woodrat. Throughout the Florida Keys, any further development of native habitats would likely negatively affect one or more protected species. Development in the Florida Keys has surpassed the capacity of several protected species to withstand the effects of further development activities.

Under current regulations, development suitability in the Florida Keys is extremely restricted. Besides privately owned parcels in infill locations or already disturbed areas, the vast majority of private lands face one or more development constraints. The FKCCS developability analysis was conservative in removing wetland parcels – over 50 percent of all private lands were removed largely due to this constraint. Development suitability was low or marginal for most of the remaining lands, due to open space requirements, lack of infrastructure or other factors.

Successful restoration of lands to create large patches of terrestrial habitats and to reestablish connectivity seems improbable. Restoration would require the conversion of large developed areas to native habitat, a goal that would face legal constraints, as well as high costs, uncertain probability of success, and a long timeframe for execution. Continuing and intensifying vacant land acquisition and restoration programs may provide more and faster returns in terms of consolidating protection of habitats in the Florida Keys.

5.2 INFRASTRUCTURE

The six future scenarios evaluated in the study call for a small amount of growth in the next 20 years – less than 10 percent growth in the number of dwelling units and population. Therefore, incremental pressures on infrastructure capacity are also moderate over a 20-year period. However, current conditions and the evaluation of future scenarios suggest that even small amounts of growth in the Florida Keys may place stringent demands on some infrastructure capacity.

The last two annual traffic studies for Monroe County (Monroe County 2001, 2002) have estimated a residential capacity of just over 6,000 units. Large year-to-year fluctuations on both traffic volumes and median speeds, even in the absence of significant development, introduce uncertainty to any future prediction of the levels of traffic on U.S.-1. The amount of growth evaluated in the future scenarios would likely result in changes in traffic within the observed recent fluctuations. In the absence of structural improvement to U.S.-1, the level of service will continue to be close to its state-mandated standard.

Similarly, hurricane evacuation clearance times would continue to increase as population increases, unless measures are taken to improvement evacuation conditions. Improvements to U.S.-1, while resulting in lower clearance times, would add to the government costs, nutrient loadings, and indirect impacts to wildlife and habitats.

Water withdrawals in the Florida Keys doubled from 1980 to 2000; they increased by 50% in the 1990s, even though development was restricted by ROGO. In the absence of effective water conservation or reuse measures, withdrawal is likely to continue to increase in the next 20 years. Permitted capacity has already been exceeded in 1999 and 2000, and model projections suggest that permit violations would continue to occur in the future scenarios. Alternative water supplies would help meet the needs for additional water. Interim measures, such as the continuous operations of two existing reverse osmosis plants (3 MGD) or the expansion of treatment facilities, would help cover demands in the short term. In the long-term, a desalination plant could meet a growing demand for water. Implementation of a desal plant would include choosing an appropriate location, as well as significant capital and maintenance costs.

5.3 SOCIOECONOMIC AND FISCAL

The six future scenarios evaluated in the FKCCS contemplate small increases in permanent population, which are unlikely to affect the overall socioeconomic structure of the Florida Keys.

The increase in the number of visitors contemplated in Scenario 3 would impose additional demands on tourist-related land uses, water supply, and recreation opportunities.

In contrast, the six future scenarios would result in a disproportionate increase in government expenditures with respect to the projected increase in population. Per capita annual expenditures are likely to increase in all the scenarios, creating immediate pressure for government to increase revenue. Tax increases on both the local population and visitors would likely occur.

5.4 MARINE ECOSYSTEMS AND SPECIES

The existing data are insufficient to establish quantitative, predictive relationships between land use or development and the marine environment. However, there is plenty of evidence of human effects on the marine ecosystems and species in the Florida Keys.

Seagrass scars, boat groundings, beach closings, coral collisions, and poor water quality in canals and other confined waters clearly expose the effects of humans on the marine environment. The CCIAM scenario analysis strongly argues for the benefits of wastewater treatment, but other impacts are more related to resource management than to land development. Recreational opportunities in the Florida Keys attract visitors from the Keys and beyond. Once in the Keys the impacts that boaters, fishermen, snorkellers, divers and others may have on the marine resources is largely related to their behavior.

5.5 IMPLEMENTATION OF THE FKCCS

The FKCCS will assist state and local government in making decisions regarding amendments to the Comprehensive Plan to ensure that future development does not exceed the capacity of the county's environment and marine systems to accommodate additional impacts.

The study and the CCIAM provide a comprehensive body of knowledge and an effective analysis tool to explore the carrying capacity consequences of development strategies in the Florida Keys.

The findings of the study suggest four main guidelines for future development in the Florida Keys:

1. Prevent encroachment into native habitat. A wealth of evidence shows that terrestrial habitats and species have been severely affected by development and further impacts would only exacerbate an already untenable condition.
2. Continue and intensify existing programs. Many initiatives to improve environmental conditions and quality of life exist in the Florida Keys. They include land acquisition programs, the wastewater and stormwater master plans, ongoing research and management activities in the Florida Keys National Marine Sanctuary, and restoration efforts throughout the Keys.

3. If further development is to occur, focus on redevelopment and infill. Opportunities for additional growth with small, potentially acceptable, additional environmental impacts may occur in areas ripe for redevelopment or already disturbed.
4. Increase efforts to manage the resources. Habitat management efforts in the Keys could increase to effectively preserve and improve the ecological values of remaining terrestrial ecosystems.